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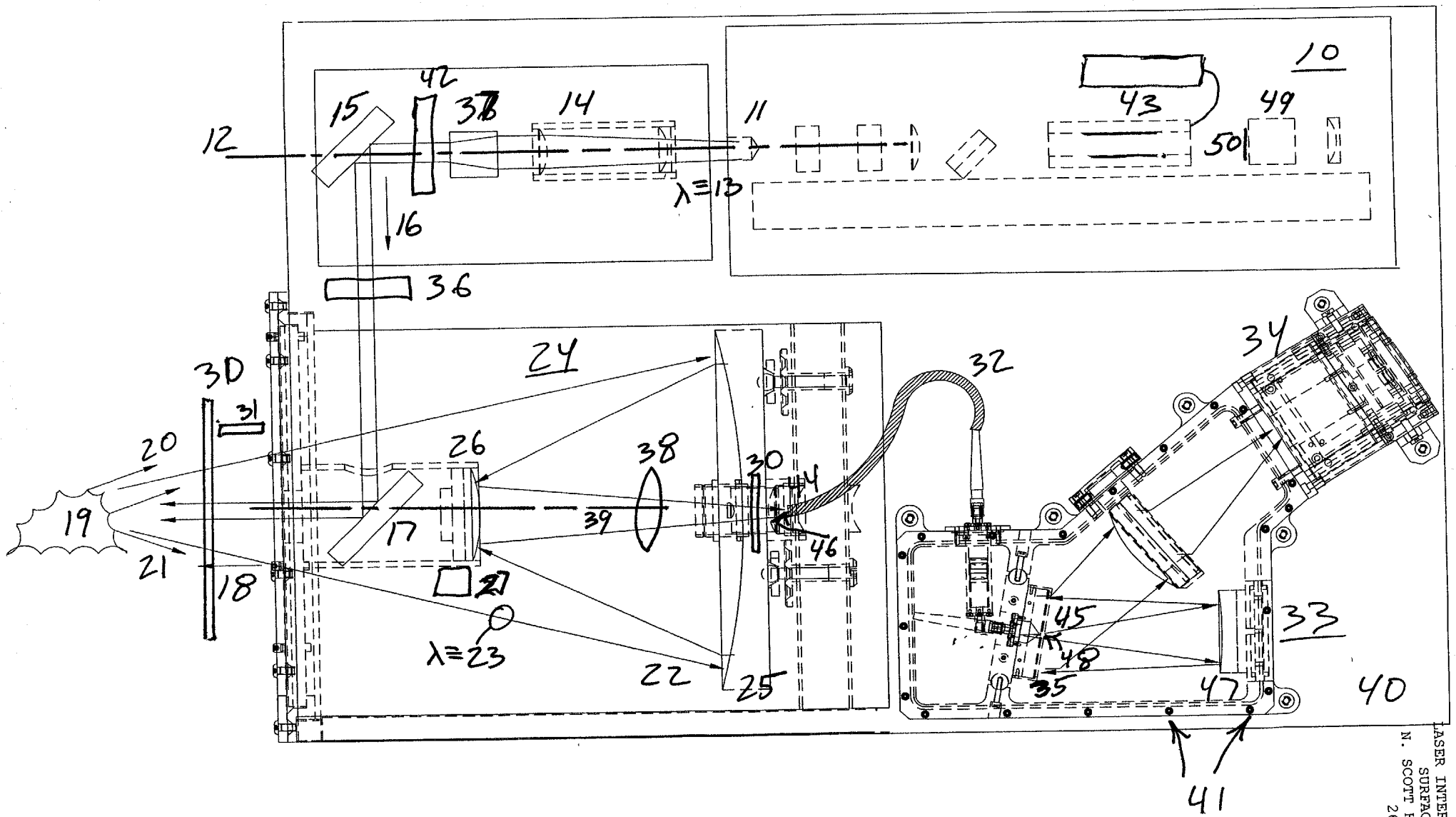
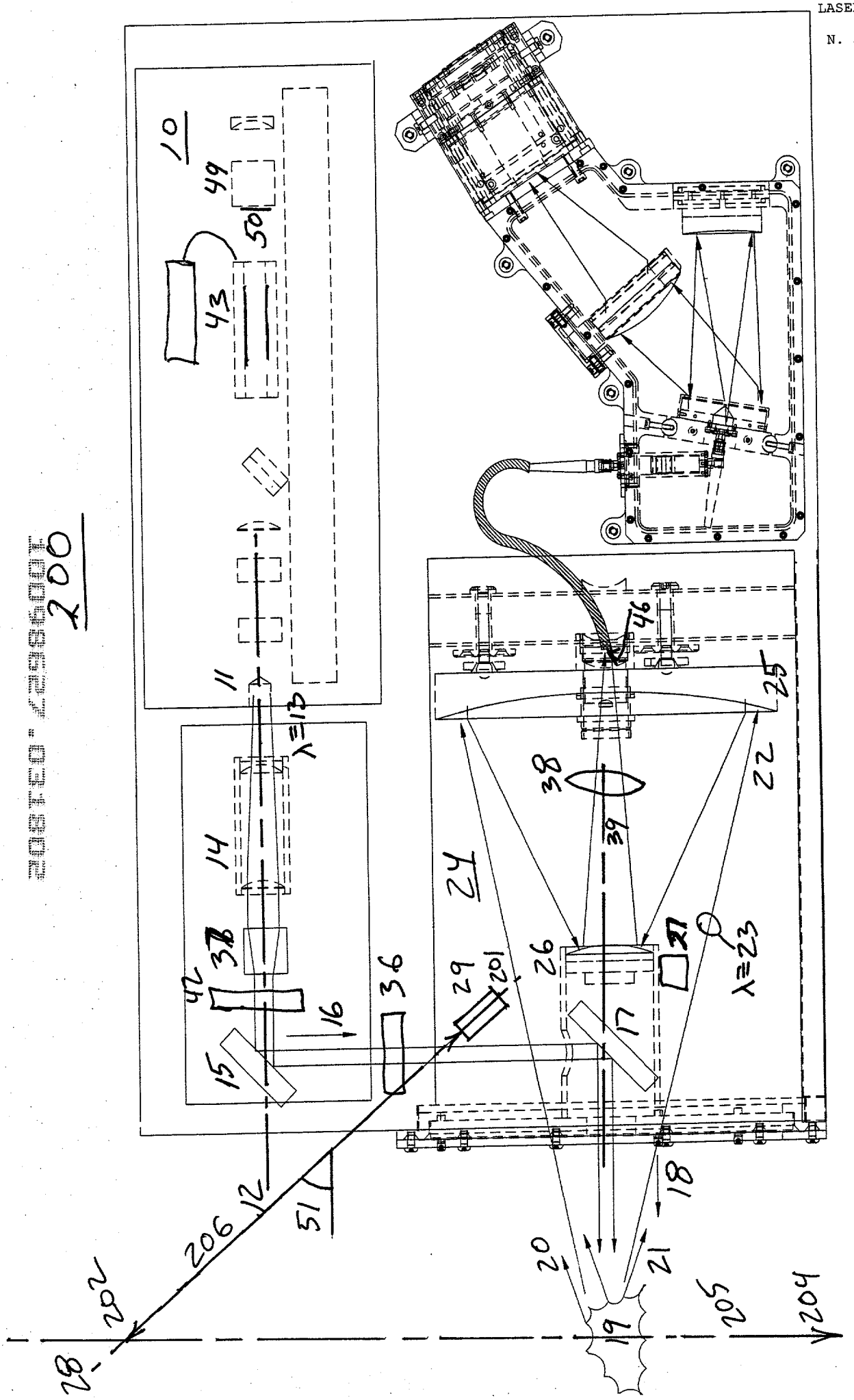


FIG. 1

LASER INTERROGATION OF SURFACE AGENTS
N. SCOTT HIGDON et al.
2651-108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21
19
205
204
206
12
51
202
28

FIG. 2

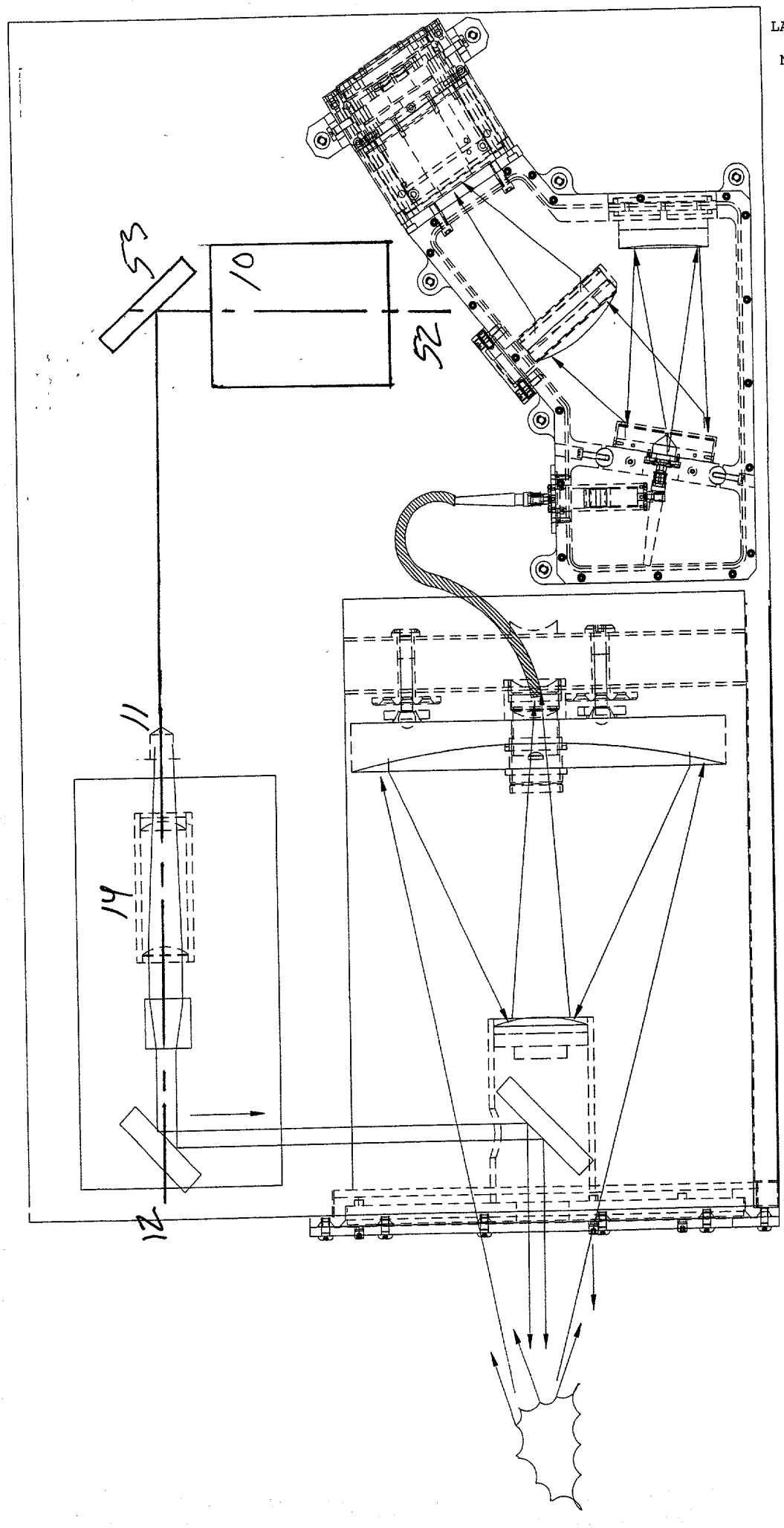
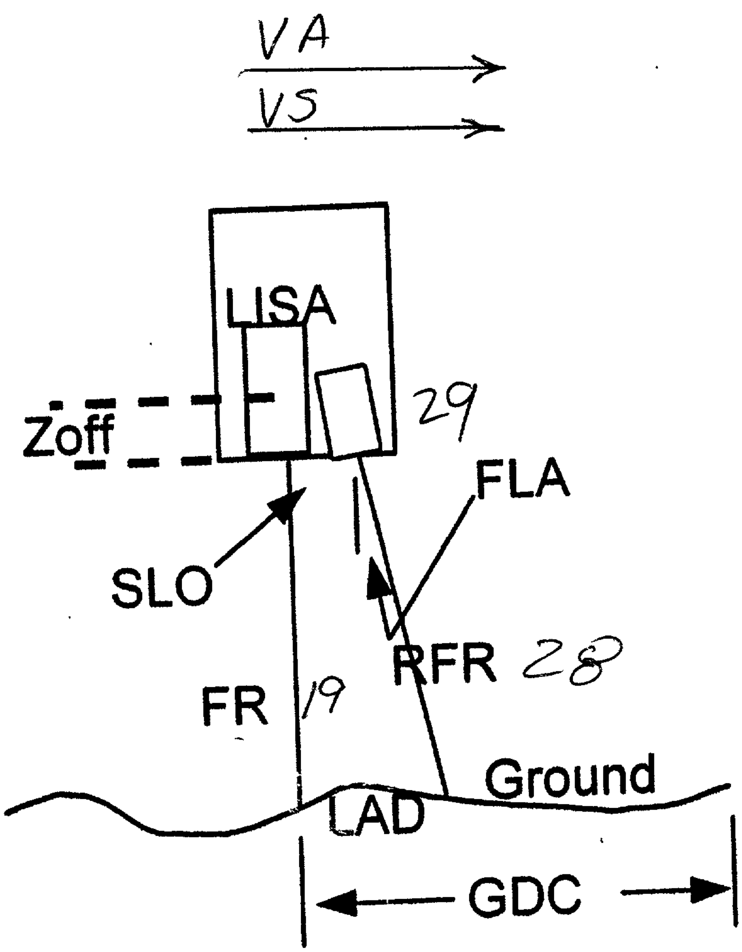
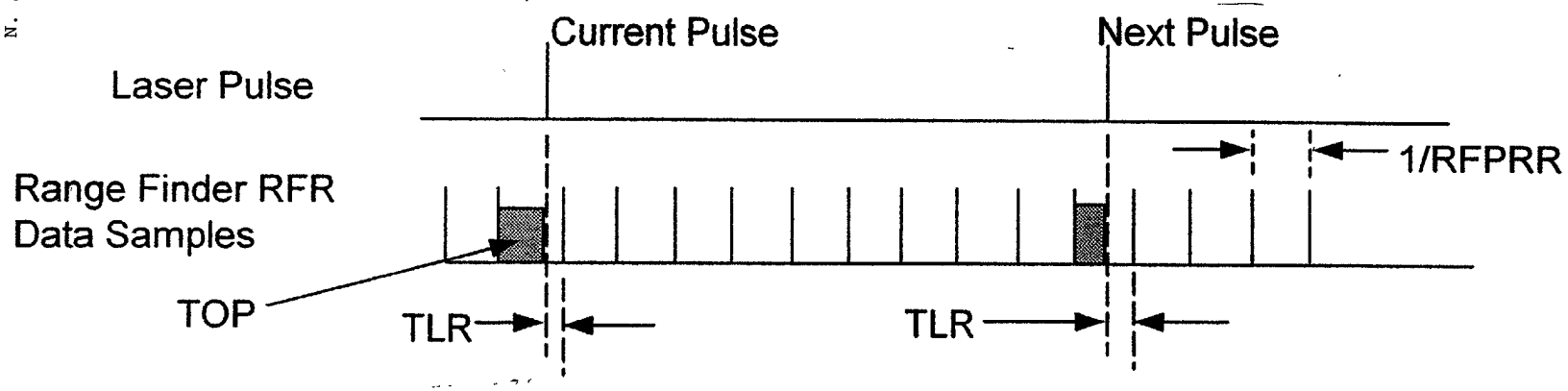


FIG. 3



: Sketch of Key Geometric Parameters

FIG. 4



: Defining The Time Interval TLR

FIG 5

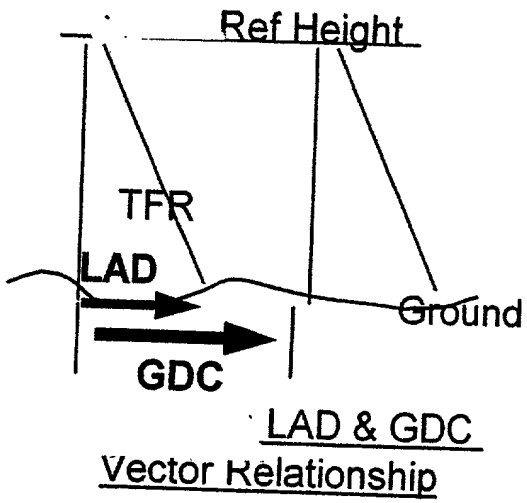


Fig 6

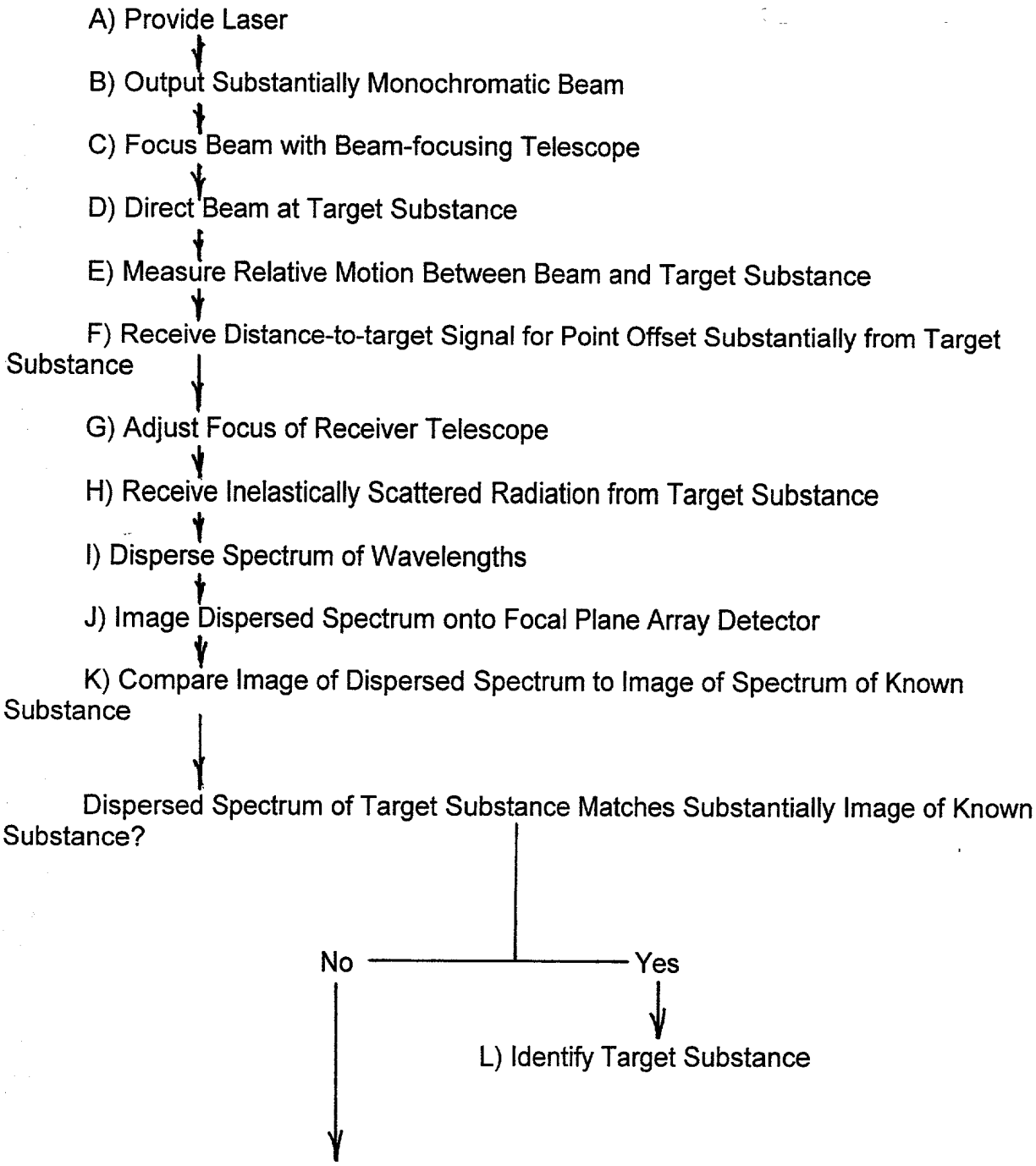

A) Provide Laser
B) Output Substantially Monochromatic Beam
C) Focus Beam with Beam-focusing Telescope
D) Direct Beam at Target Substance
E) Measure Relative Motion Between Beam and Target Substance
F) Receive Distance-to-target Signal for Point Offset Substantially from Target Substance
G) Adjust Focus of Receiver Telescope
H) Receive Inelastically Scattered Radiation from Target Substance
I) Disperse Spectrum of Wavelengths
J) Image Dispersed Spectrum onto Focal Plane Array Detector
K) Compare Image of Dispersed Spectrum to Image of Spectrum of Known Substance
Dispersed Spectrum of Target Substance Matches Substantially Image of Known Substance?
No
Yes
L) Identify Target Substance
M) Add Image of Dispersed Spectrum of Target Substance to List of Unidentified Substances

Fig. 7

A) Provide Laser
↓
AA) Disengage On-board Cylinder
↓
AB) Release On-board Cylinder Retainer
↓
AC) Remove On-board Cylinder
↓
AD) Install New On-board Cylinder

Fig. 8

AAA) Indicate Low Gas Bottle Pressure
↓
AAB) Lock On-board Valves Shut
↓
AA) Disengage On-board Cylinder

Fig. 9

AD) Install New On-board Cylinder
↓
ADA) Purge Gas Lines by Releasing Gas from Cylinder
↓
ADB) Vent Gas Through On-board Gas Filter
↓
ADC) Replenishing Gas of Laser

Fig. 10

B) Output Substantially Monochromatic Beam
↓
BA) Setting Pulse Rate of Laser

Fig. 11

G) Adjust Focus of Receiver Telescope

↓

GA) Receive Range-to-target Data Sample

↓

GB) Tag Range-to-target Data Sample with Time Sequence

↓

GC) Receive Relative Motion Data Sample

↓

GD) Calculate Rate of Change of Relative Motion

↓

GE Correct Range-to-target Data Sample for Relative Motion

↓

GF Correct Range-to-target Data Sample for Rate of Change of Relative Motion

↓

GG) Correct Range-to-target Data Sample for Laser Pulse Rate

↓

GH) Correct Range-to-target Data Sample for Range-finder Pulse Rate

↓

GI) Correct Range-to-target Data Sample for Range-finder Position Relative to Receiver Telescope Line-of-sight

↓

GJ) Correct Tagged Range-to-target Data Sample for Laser and Rangefinder Waveform De-synchronization Time Offset

↓

GK) Transform Set of Co-ordinates of Corrected Tagged Range-finder Sample to Receiver Telescope Line-of-sight

↓

GL) Convert Range-to-target Sample to Equivalent Receiver Telescope Secondary Reflector Position

Fig. 12